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TOLLER

MODIFICATION PROCEDURE
FOR
MODERNIZATION OF THE MODEL BA–105A

Modification Kit Number: 1–004489–001

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INSTRUCTION MANUAL NO. 1–500783–222

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SINGER
INSTRUMENTATION

The Singer Company, Los Angeles Operation • 3211 South La Cienega Blvd., Los Angeles, Ca. 90016

MODIFICATION PROCEDURE
CONVERSION OF MODEL BA-105A BASIC MEASURING UNIT

(Modification Kit Number: 1-004489-001)

PURPOSE

This kit provides the following:

1. Replaces five type 6X4 rectifier tubes with silicon diodes.
2. Adds separate solid state series regulation to the +150 and +250 volt circuits.
3. Increases the impulse generator charging voltage source from 300 volts to 450 volts and also provides independent regulation of this voltage for increased stability.
4. Adds separate protective fuses to the +150V, +250V and ±450V circuit at output of the regulators.

NOTE

This modification is intended for the Model BA-105A and the Model BA-105 units without the sine wave calibrator. The older units can be modified by removing the sine wave calibrator circuit or by relocating that portion of the circuit that physically interfers with the placement of the A2 assembly.

KIT PARTS SUPPLIED

1. 1 each Rectifier - Output Regulator A2 Assembly

   Singer Part No. 1-004476-002

2. 1 each Resistor, 10 ohms ±5%, 2W

   Singer Part No. 1-945003-114

3. 1 each Resistor, 150K ohms ±5%, 2W

   Singer Part No. 1-945003-214

4. 1 each Resistor, 0.33 Meg. ±5%, 2W

   Singer Part No. 1-945095-001

5. 1 each Instruction Manual

   Singer Part No. 1-500783-222

6. 1 each Addendum, Singer No. 1-500783-187(1), including:

   1 each Figure 5-1, Model BA-105A Basic Measuring Unit, Schematic Diagram (Sheet 1 of 4). (Revised).

   1 each Figure 5-1, Model BA-105A Basic Measuring Unit, Schematic Diagram (Sheet 3 of 4). (Revised).

PREPARE BA-105A FOR MODIFICATION

1. With no tuning unit installed in the basic unit, lift the rear of the equipment so that the basic unit rests on its front panel. Remove the 13 screws that secure the cabinet to the equipment frame and carefully lift the cabinet from the frame.

2. Remove the five 6X4 rectifiers V26, V27, V28, V29, V30 and their tube shields.

3. Turn the cabinet on its left side with the bottom of the chassis facing the front.

MODIFICATION PROCEDURE (Refer to Figures 1, 2 and 5-1 included in addendum).

1. Remove the two screws and lock-washers and the cable clamp hardware from the bottom of chassis, see Figure 1.

2. Position the Rectifier - Output Regulator A2 Assembly against the bottom of the chassis with the three potentiometers approximately 1 1/2 inches below the terminal strip. Align the three mounting holes of the A2 assembly with holes exposed in step 1 above and replace the hardware.

3. Replace R161 (390K, 1W) with the 150K, 2W resistor, see figure 2, terminal board TB5.

4. Remove R158, (100 ohms 1/2W) and R159 (4.7K ohms, 1/2W) from terminal board TB5 (terminals 10, 11 and 22).

5. Replace R164 on the terminal strip with the 0.33 Meg ±5%, 2 Watt resistor, see figure 2.

6. Replace R239 on the terminal strip with the 10 ohm ±5%, 2 Watt resistor, see figure 2.

7. Separate the red wire in the existing cable harness below the A2 assembly. This wire is from the junction of C195B and L59B. Cut this wire and connect one end to terminal 17 of A2TB2 and the other end to the terminal of A2F2, see figure 2.

8. Make all connections of the A2 assembly harness wires that are shown in figure 2. Be sure to remove existing wires from the terminals when instructed to do so by an asterisk (*) in figure 2.

WARNING

Do not remove existing wires unless so instructed. Insulate disconnected ends.

9. Remove the connections to the positive terminals of C165A and B, leave connections to common terminal.

10. Lift the connection from T11 pin 9 and connect it to pin 10, leaving original connection to pin 10.

11. Disconnect the wire (1 of 3) on terminal 5 of the "terminal strip" that supplies the 6X4 heater circuit, see figure 2. The two remaining wires go to T11, pin 11 and to R149.

12. The circuit modification is now completed.

VOLTAGE ADJUSTMENT

1. Check fuses in the A2 assembly. Fuses F1 and F3 are 1/16 Ampere and F2 is 1/8 Ampere.

2. Energize the BA-105A with an RF Tuning unit installed.

3. Measure the voltage from F1 to chassis ground with a VOM or digital voltmeter. Adjust as necessary to +250 volts with R4 control. Secure R4 locking nut after adjustment.

4. Measure the voltage from F2 to chassis ground. Adjust as necessary to +150 volts with R9 control. Secure R9 locking nut after adjustment.

450.00
22.50
427.50

5. Measure the voltage from F3 to pin 14 of TB2 with "IMPULSE GEN." switch S6 in "ON" position. The voltage should be 450 ±5%. This voltage is controlled by A2CR10 thru A2CR14 Zener diode regulator string.

6. Measure the voltage from the low potential end of R149 to chassis ground. It should measure 5.8 volts AC. Adjust R149 as required.

IMPULSE GENERATOR CALIBRATION

1. Connect the output of a certified IG-115 impulse generator to the SIGNAL INPUT connector of the NF-105. Adjust the IG-115 output to exactly 80 dB above 1 uV/MHz RMS. (Be sure to use any IG-115 correction factors required to provide an impulse output in RMS terms).

2. Use a T-1/NF-105 Tuning Unit in the BA-105 basic unit tuned to a frequency of 200 MHz.

3. Set the INPUT ATTENUATOR dB to the 40 dB position.

4. Set the FUNCTION SELECTOR switch to the PEAK BROADBAND position.

5. Adjust the IF GAIN control for a reference output meter indication of 10 microvolts.

6. Remove the RF cable from the IG-115 impulse generator and connect it to the IG OUTPUT connector on the BA-105 unit.

7. Set the IG LEVEL dBuV/MHz switch to the 80 position.

8. Adjust the IG RATE Hz switch and IG RATE Hz control for a pulse repetition rate of 60 pulses per second.

9. Depress the IMPULSE GENERATOR IG switch.

10. Adjust the IG VERNIER ADD TO IG LEVEL control for the same 10 microvolt reference reading on the output meter used in step (5) above.

11. Note the IG VERNIER ADD TO IG LEVEL meter reading. It should indicate "0" dB. If not adjust A2R13 control for a reading of "0" dB. Tighten A2R13 locking nut.

NOTE

If the range of A2R13 is limited, first check the voltage across A2C6, it should be 450±5% volts. Likewise, check the voltage across C207 (feed-through capacitor located at the end of a pipe rising from the impulser at an angle of approximately 45 degrees). It should measure 400 ±30 volts. If the voltages are correct, then select another resistor value for R164 (use a 2W deposited film type resistor for temperature stability).

NF-105A INSTRUCTION MANAUL CORRECTIONS

1. Replace the NF-105A instruction manual schematics figure 5-1 sheet 1 and 3, with the revised schematics supplied with this kit.

2. Add addendum No. 1-500783-187(1) supplied with this kit to the NF-105A instruction manual.

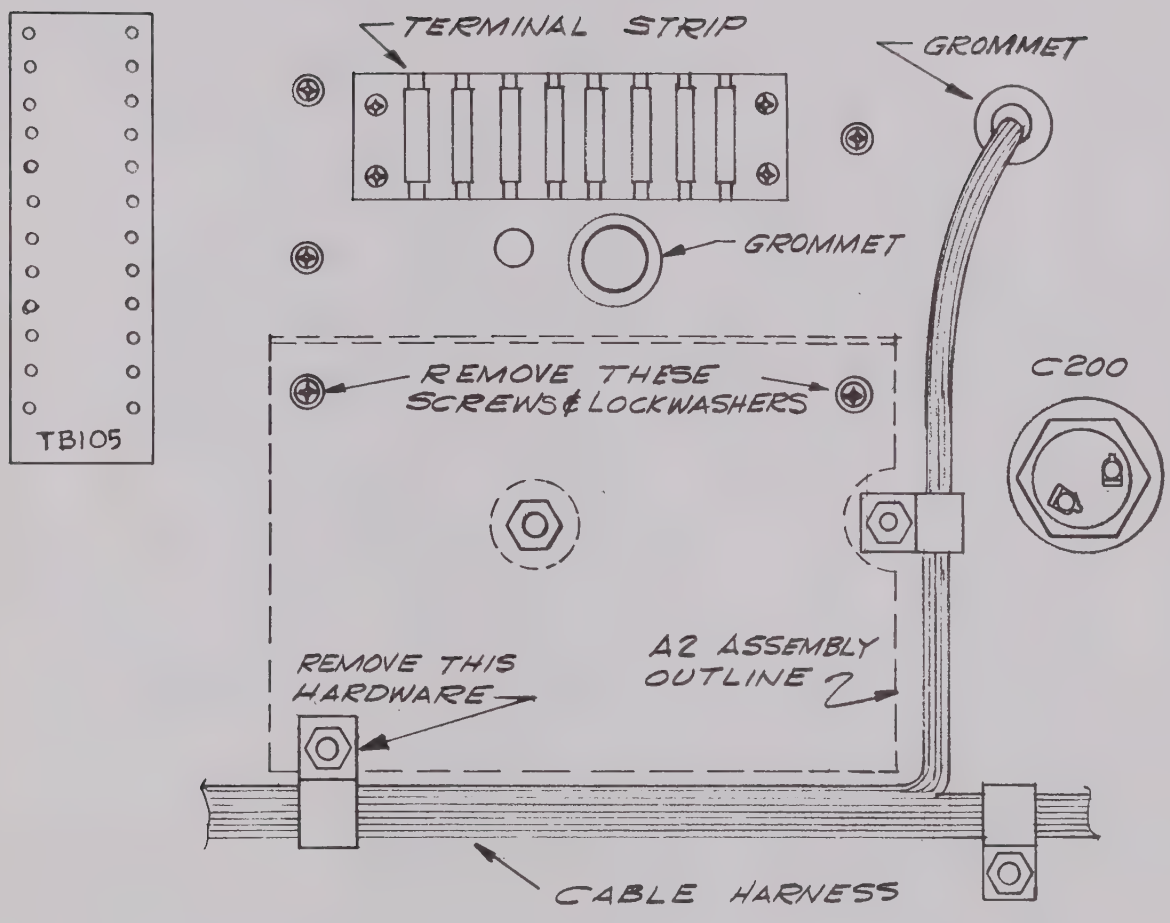


FIGURE 1. HARDWARE LOCATION

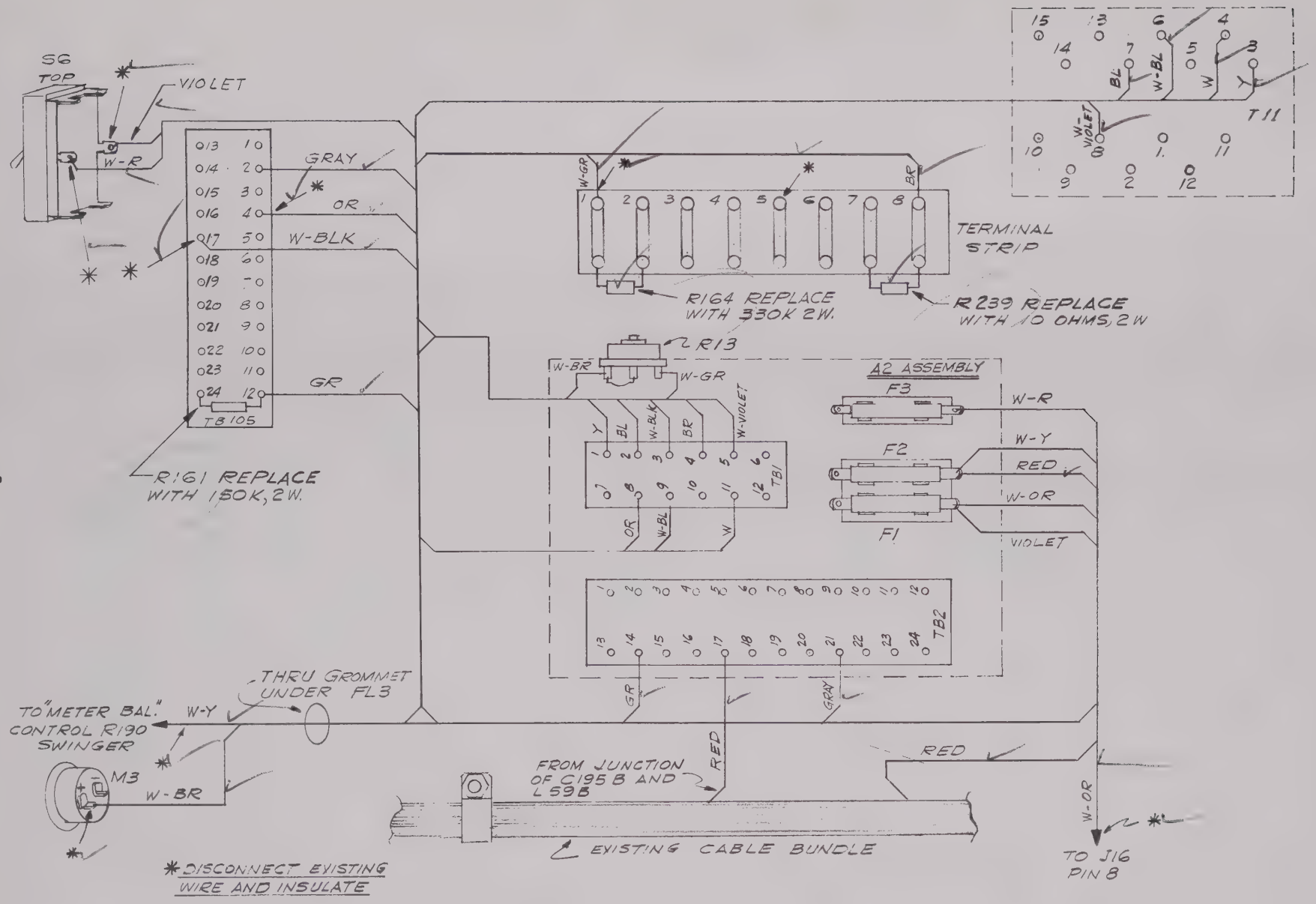
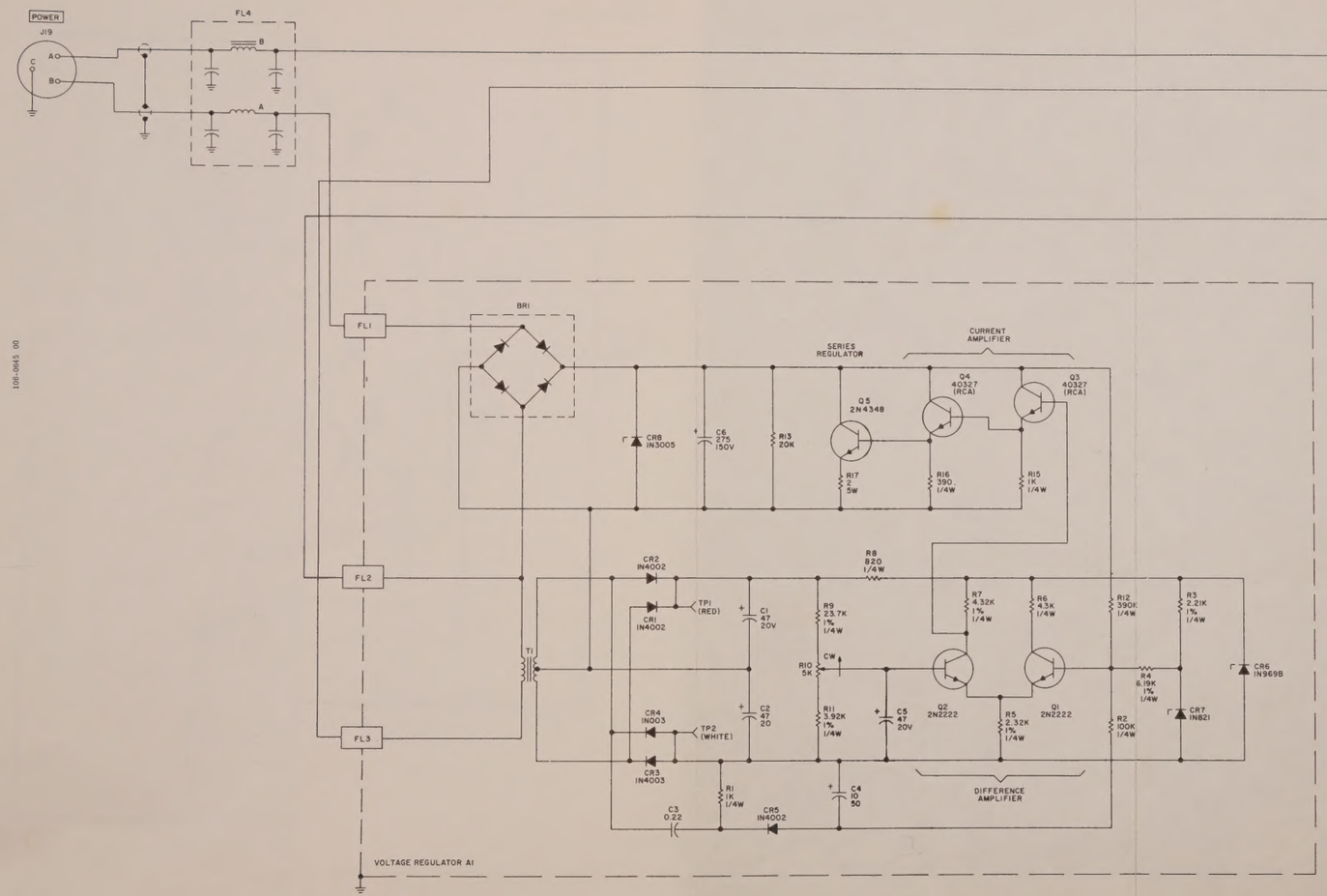
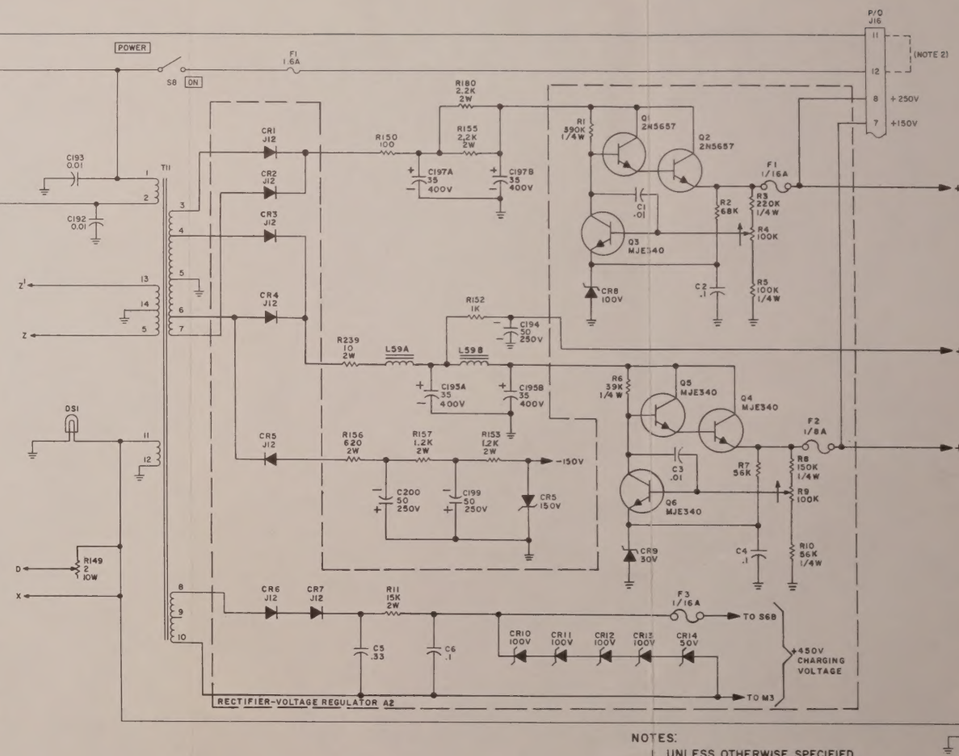

SG TOP
VIOLET
W-R
GRAY
OR
W-BLK
GR
TB 105
R161 REPLACE WITH 150K, 2W.
T11
TERMINAL STRIP
R164 REPLACE WITH 330K 2W.
R239 REPLACE WITH 10 OHMS, 2W
R13
A2 ASSEMBLY
F3
F2
F1
TB1
TB2
W-Y
RED
W-OR
VIOLET
THRU GROMMET UNDER FL3
TO "METER BAL." CONTROL R190 SWINGER
M3
W-BR
FROM JUNCTION OF C195 B AND L59B
EXISTING CABLE BUNDLE
TO J16 PIN 8
*DISCONNECT EXISTING WIRE AND INSULATE

FIGURE 2.





NOTES:

1. UNLESS OTHERWISE SPECIFIED RESISTANCE VALUES ARE IN OHMS, ±5%, 1/2W.
   CAPACITANCE VALUES ARE IN MICROFARADS.
2. CIRCUIT COMPLETED UPON INSERTION OF TUNING UNIT INTO BASIC ASSEMBLY.
3. ☐ INDICATES FRONT PANEL MARKING.

Figure 5-1. Model BA-105A Basic Measuring Unit, Schematic Diagram (Sheet 1 of 4)

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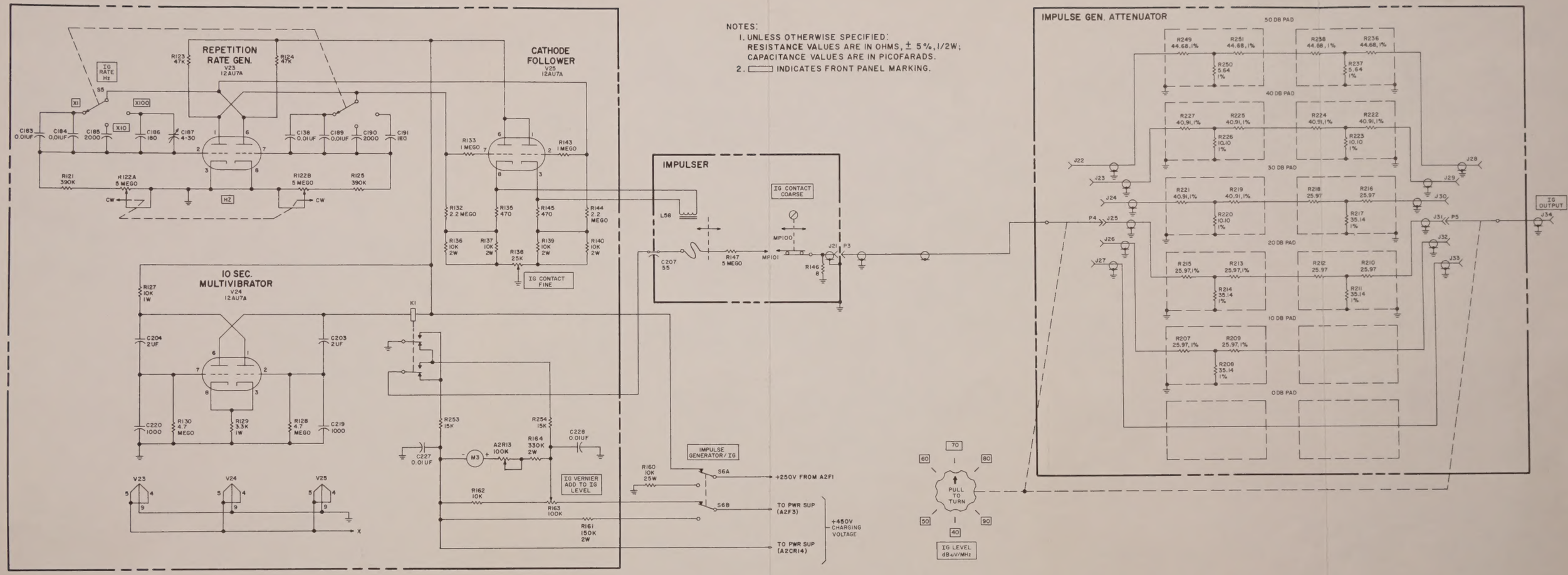

Figure 5-1. Model BA-105A Basic Measuring Unit, Schematic Diagram (Sheet 3 of 4)

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